EPA Air Innovations Conference

How Can Tribal Renewable Energy Efforts Help Air Quality and Climate Change?

Environmental & Climate Justice, Air Quality and Water Conservation
Clean Electricity Through Utility Scale Distributed Renewable Energy

Patrick Spears, President, Intertribal COUP

EARTH AT DAWN

INTERTRIBAL
Council On Utility Policy
COUP

Tribes Building Sustainable Homeland Economies

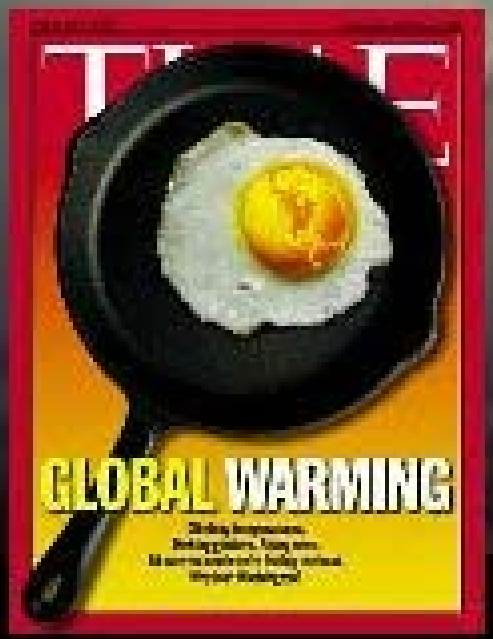
P.O. Box 25, Rosebud, SD 57570

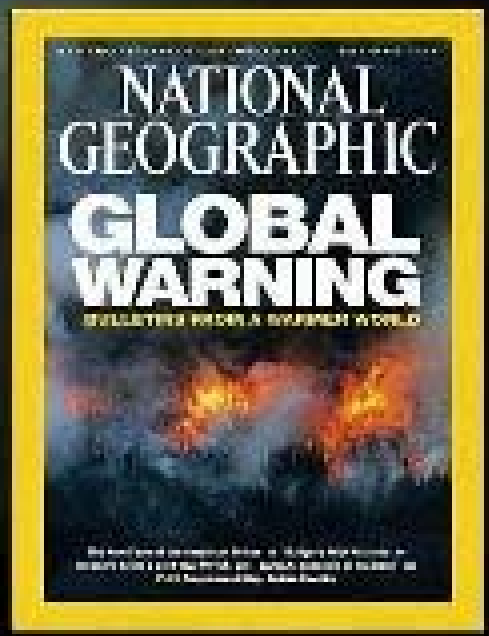
Pat Spears, President - Lower Brule Reservation, SD
Terry Fredericks, Vice President - Ft. Berthold Reservation, ND
Bob Gough, Secretary - Rosebud Reservation, SD
Bill Schumacher, Treasurer - Flaudreau Santee Reservation, SD

www.EnergyIndependenceDay.org
www.NativeWind.org

Global Warning:

A real and present danger...





CLIMATE CHANGE - NATIONAL SECURITY

An Abrupt Climate Change Scenario and Its Implications for United States National Security

A report commissioned by the U.S. Defense Department

By Peter Schwartz and Doug Randall

"[G]lobal warming should be elevated beyond a scientific debate to a U.S. national security concern."

http://www.ems.org/climate/pentagon_climate_change.html

CLIMATE CHANGE - INSURANCE - THREATS

Scientists expect global warming to trigger increasingly frequent and violent storms, heat waves, flooding, tornadoes, and cyclones while other areas slip into cold or drought.

[A Swiss RE] report comes as a growing number of policy experts warn that the environment is emerging as the security threat of the 21st century, eclipsing terrorism.

Controlling the increase of green house gas emissions "would take 40 successful Kyotos. But we've got to do it"

Dr. Jerry Mahlman,
National Center for Atmospheric Research
National Geographic, Sept 2004

Growing Public Awareness of Changing Climate In the Aftermath of Hurricanes Charley, Frances and Jeanne

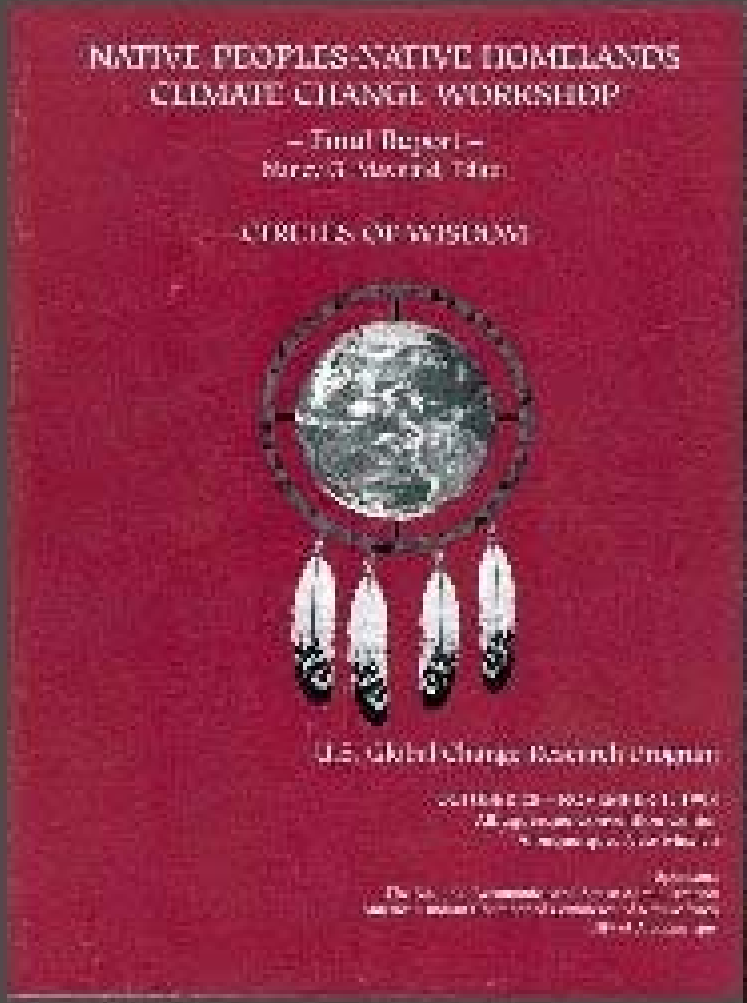
Native Wind Powering America

Tribal Renewable Energy

Rosebud Sioux 750 kW

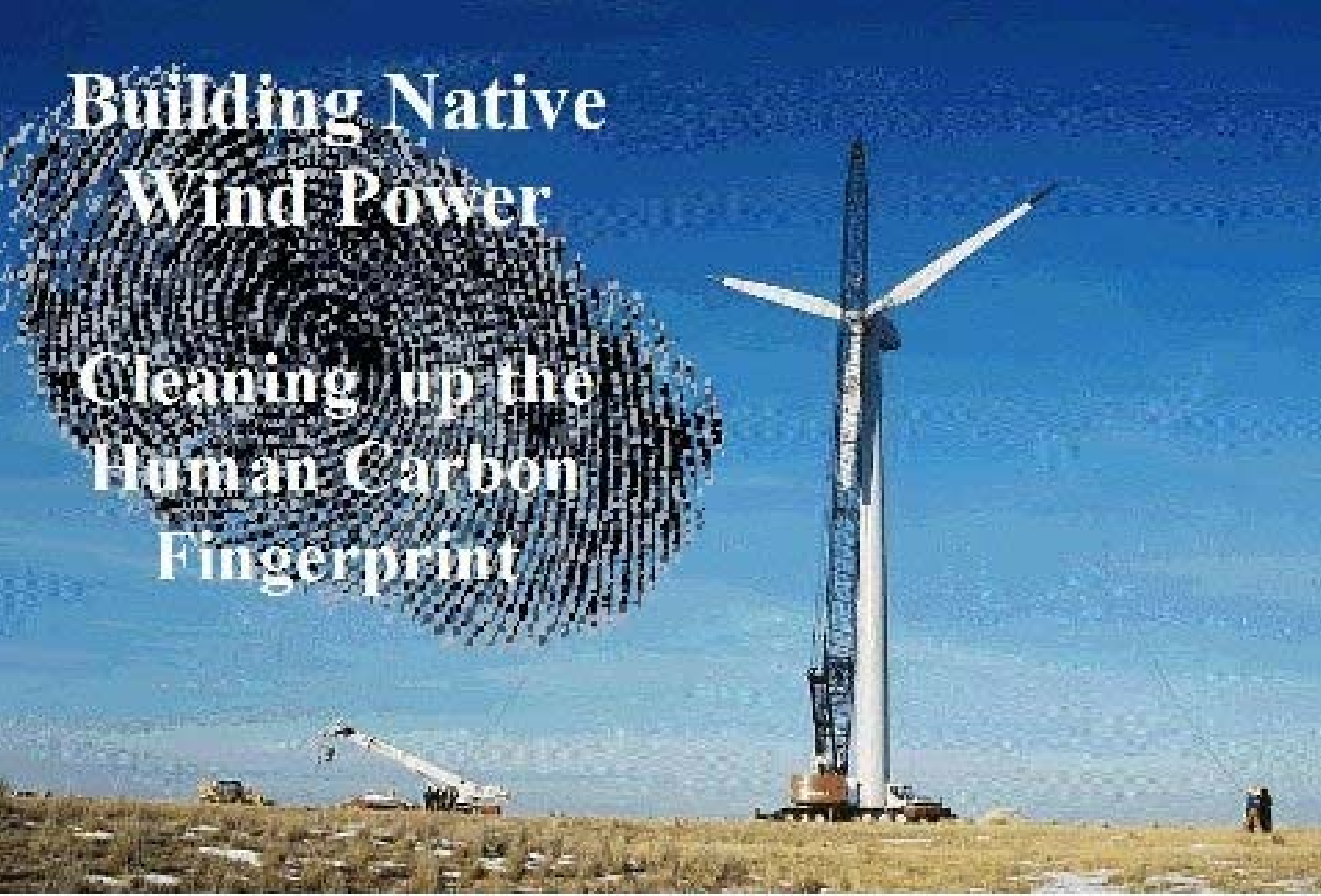
- Indian Reservations are the poorest communities with highest unemployment rates in the nation.
- Indian Tribes are the fastest growing populations in the U.S with half the members under 18 years of age, and all growth is natural, not immigration.
- Reservations homes are 10 times more likely (14.2%) to be without electricity than rest of U.S.
- Tribes have hundreds of giga-watts of renewable energy potential. Theoretically, Tribes could meet most of U.S. electric energy needs.
- Federal Trust Responsibility to build Tribal Sustainable Homeland Economies/Federal Markets

http://www.eia.doe.gov/cneaf/solar.renewables/page/pubs.html

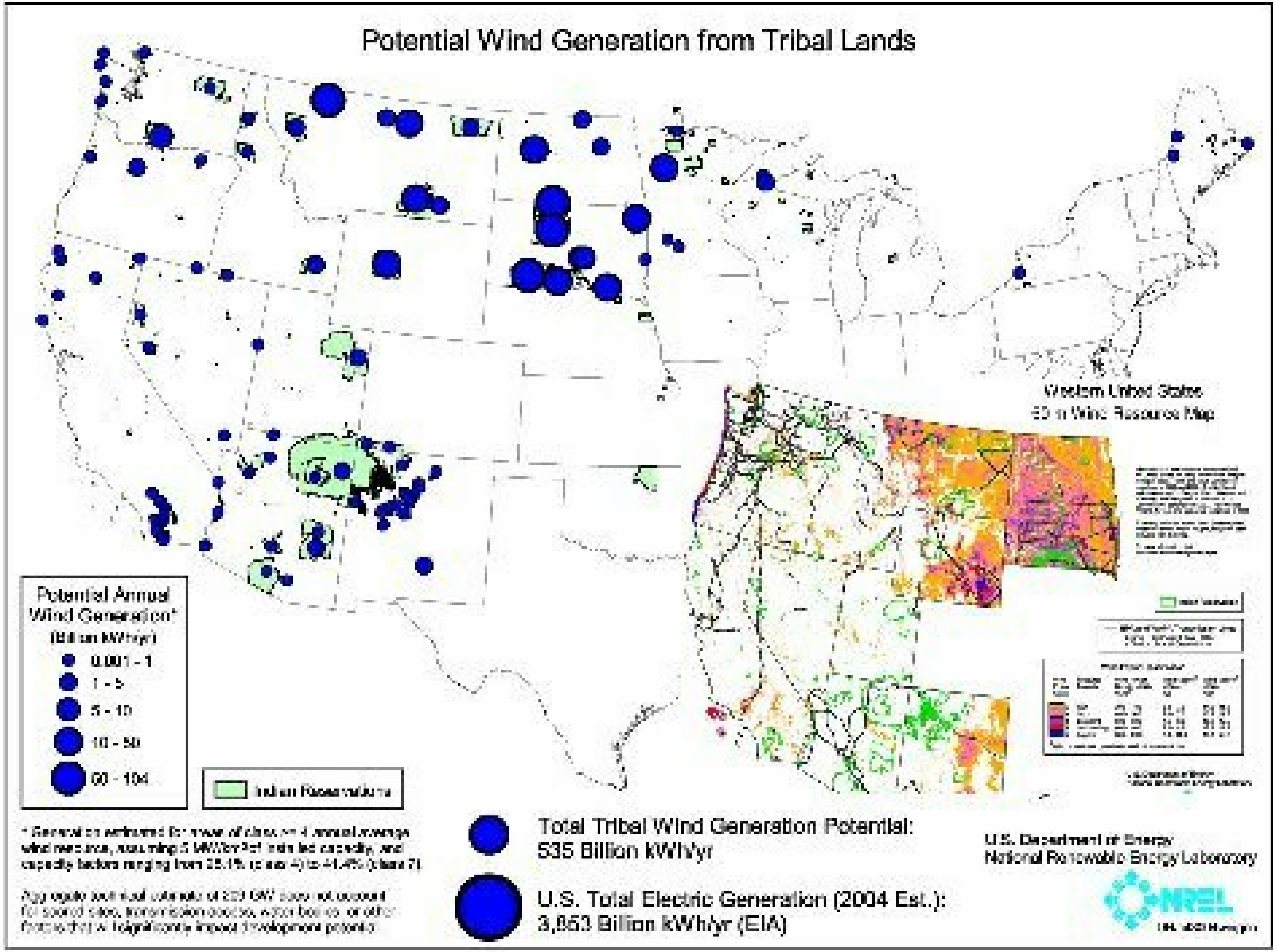


"Entering the 21st century, a prime Native strategy encourages the development of sustainable homeland economies to ensure survival as Nations and for the restoration of a more balanced climate for Mother Earth. The Strategy includes the protection of naturally diverse ecosystems and the use of renewable energy technologies."

www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf



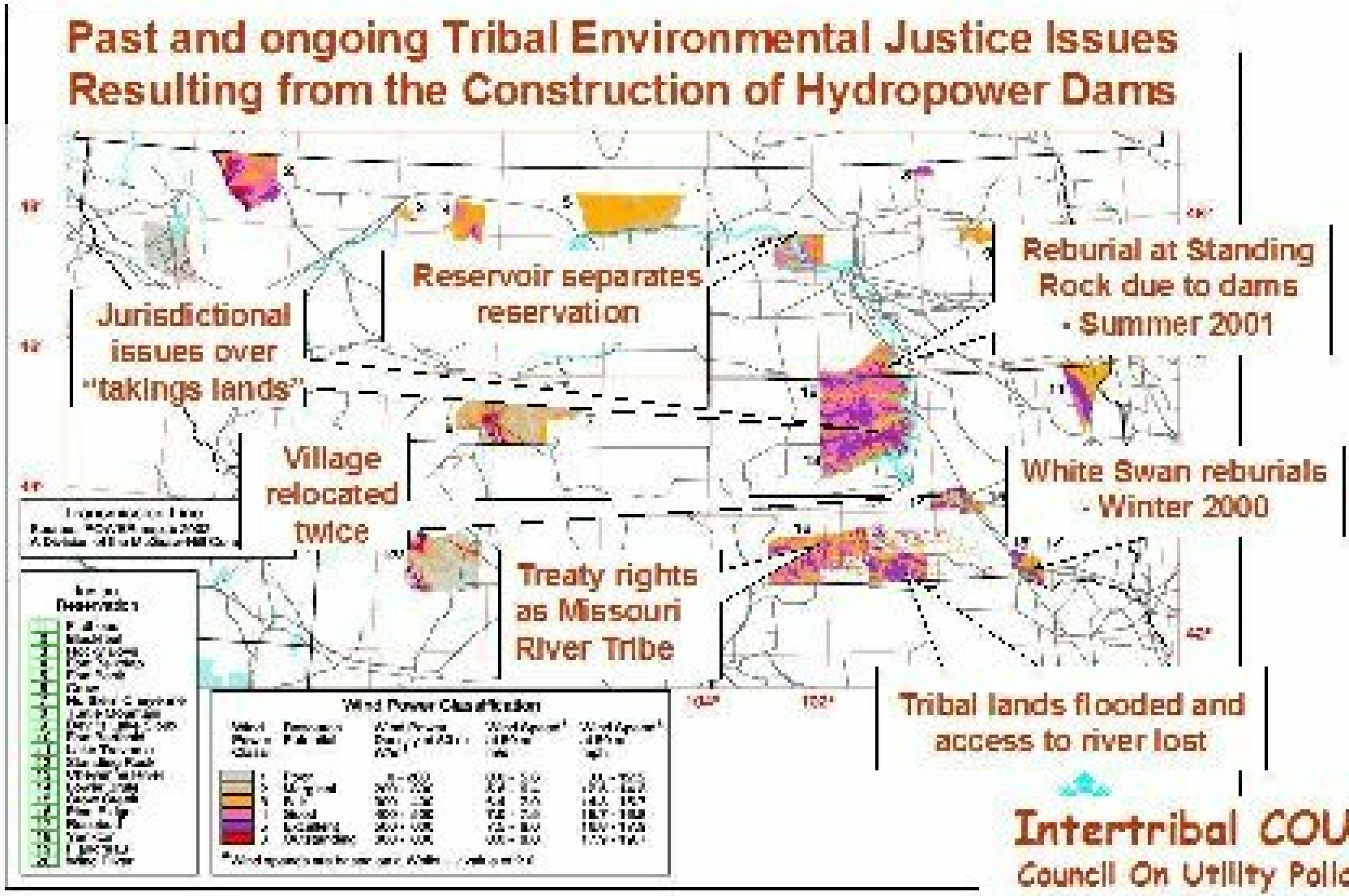
NativeWind.org


Potential Wind Generation from Tribal Lands
Western United States
50 m Wind Resource Map
Potential Annual Wind Generation*
(Billion kWh/yr)
0.001 - 1
1 - 5
5 - 10
10 - 50
50 - 104
Indian Reservations
Total Tribal Wind Generation Potential:
535 Billion kWh/yr
U.S. Total Electric Generation (2004 Est.):
3,953 Billion kWh/yr (EIA)
U.S. Department of Energy
National Renewable Energy Laboratory
NREL

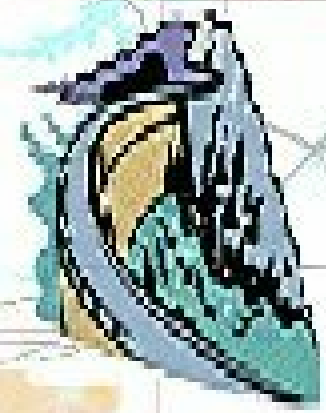
Intertribal Wind Planning and Policy Project

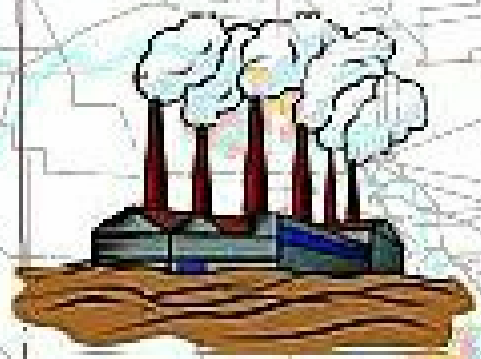
Intertribal Council On Utility Policy (COUP)

Wind Resources on Northern Plains Reservations located in the Eastern Pick-Sloan Region (Upper Missouri River Basin) of the Western Area Power Administration (WAPA) Grid



The Evolution of Energy on the Great Plains





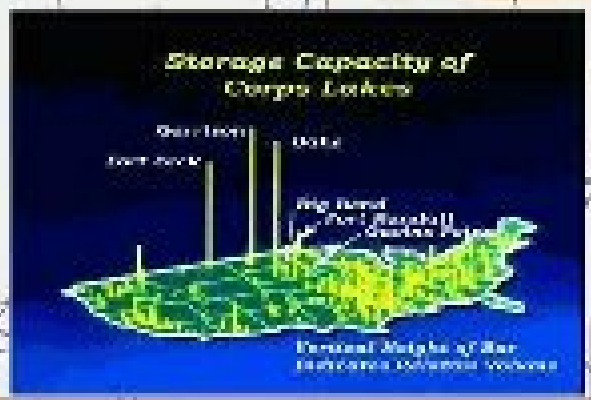
Our Great Plains electrical systems began with small, off grid wind power. Large scale hydropower, with federal transmission and rural coop distribution, displaced wind chargers, until coal fired generation came to dominate over 80% of the regional grid.

Hydro and coal critically depend upon consuming our water and air resources, while wind does not.

Large Scale Federal Hydropower

~~Once 100% hydropower on the grid, now:~~

Over 80%[5] coal and less than 20% hydropower

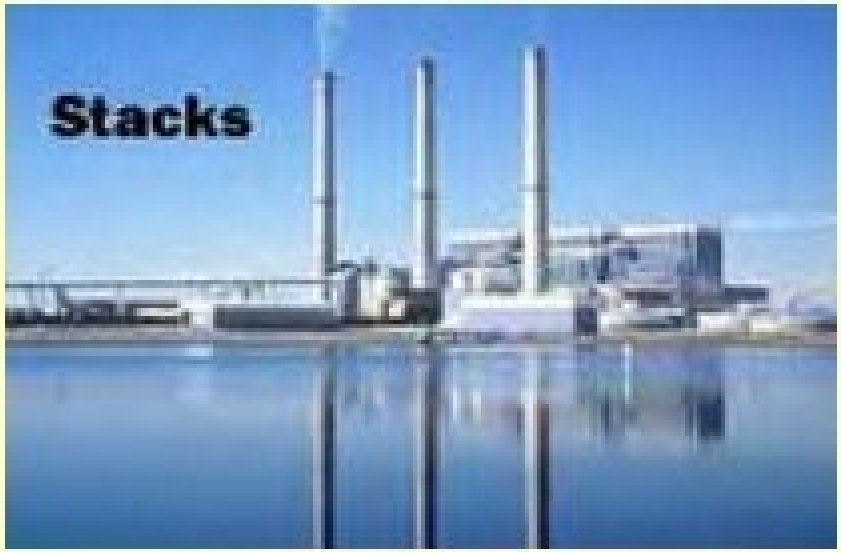


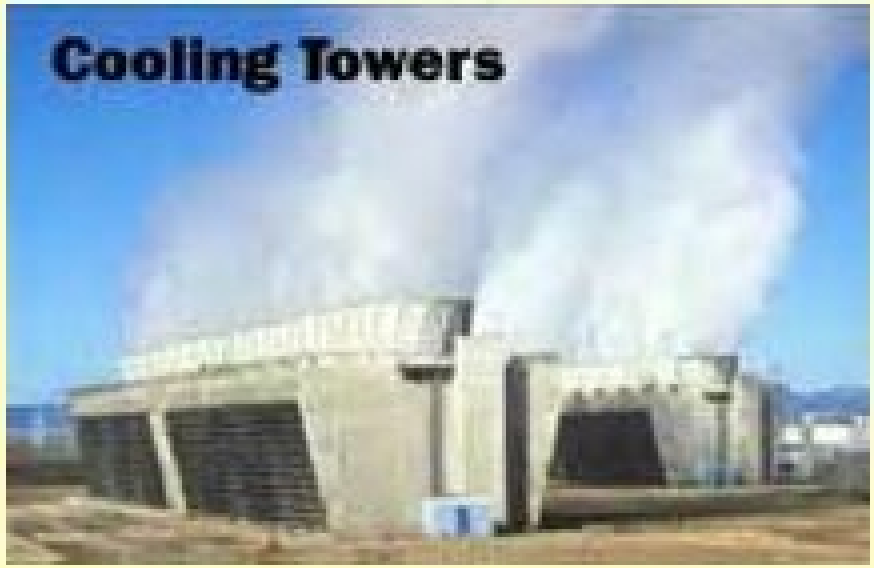
Lake Sharpe, South Dakota, U.S.A.

Lake Sharpe and the big bend of the Missouri River are apparent in this low-oblique photograph. Big Bend Dam is discernible just beyond the big bend of the river.

Visible to the northwest are the Oahe Dam and Lake Oahe, built to provide hydroelectric power, flood control, irrigation for agriculture, and recreation. Circular-pivot irrigation field patterns are discernible east of the dam and along Lake Sharpe, especially near the big bend area of the lake.

Thermal Electricity Generation Evaporates Thousands of Gallons of Water per Minute!!





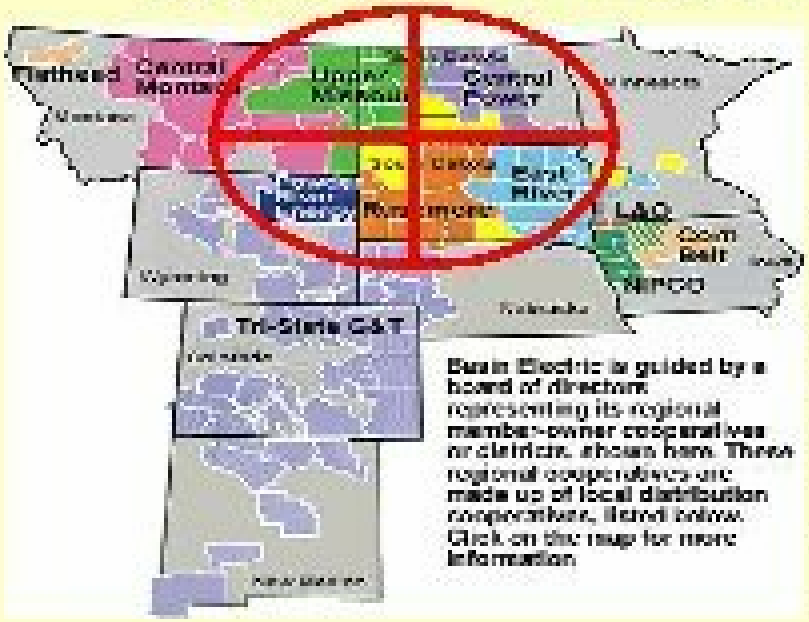
Induced-draft fans, located near the stack, pull the exhaust gases through the environmental equipment and send it up the stack. **On cold days, the white plume from the stack of this type of plant is actually just water vapor condensing. On hot days, even though the plant is operating, stack emissions are clear.**

The hot water is pumped from the condenser to the top of the cooling tower. It cascades to the bottom against cool air being forced up by two dozen 22-foot diameter fans at the base of the cooling tower. **Cooling takes place by evaporating thousands of gallons of water per minute from each tower.** Not all plants use cooling towers; some pump water from a lake or river and return it.

Source: http://www.howstuffworks.com/

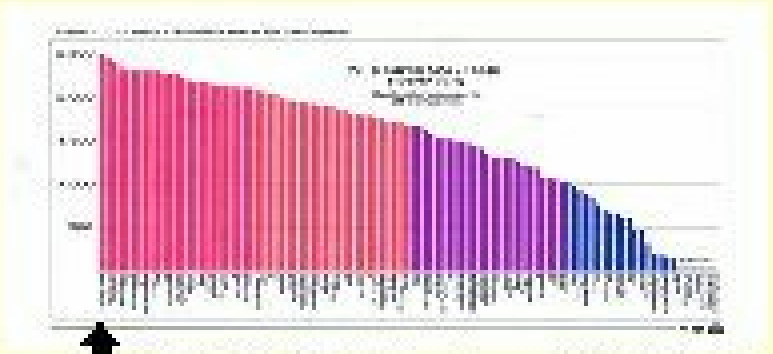
Intertribal Council On Utility Policy

BASIN ELECTRIC G&T RANKS #1



A recent study ranked the companies based on the amount of pollution produced relative to their power output. By that measure, Basin Electric Power Cooperative, a relatively small utility in Bismarck, ND, that relies primarily on coal-fired power plants to supply over 100 rural electric co-ops, was identified as producing the *highest output of carbon dioxide per megawatt-hour of electricity.* But the company contends that its plants are among the cleanest coal-burning plants in the nation.

Highest Output of CO_2/MWh in the U.S



BASIN Electric Assn. RANKS #1

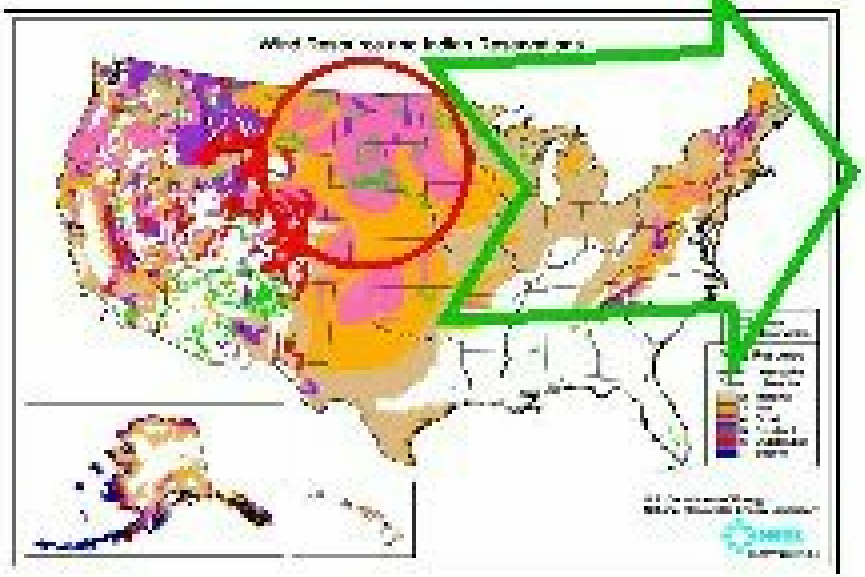
"Bench marking Air Emissions of the 100 Largest Electric Generation Owners in the U.S. - 2000." Natural Resources Defense Council and Coalition for Environmentally Responsible Economies, and Public Service Enterprise Group (a Newark NJ utility). From "Study Ranking Utility Polluters Aims to Sway Emissions Debate", By MATTHEW L. WALD, NYT, March 21, 2002

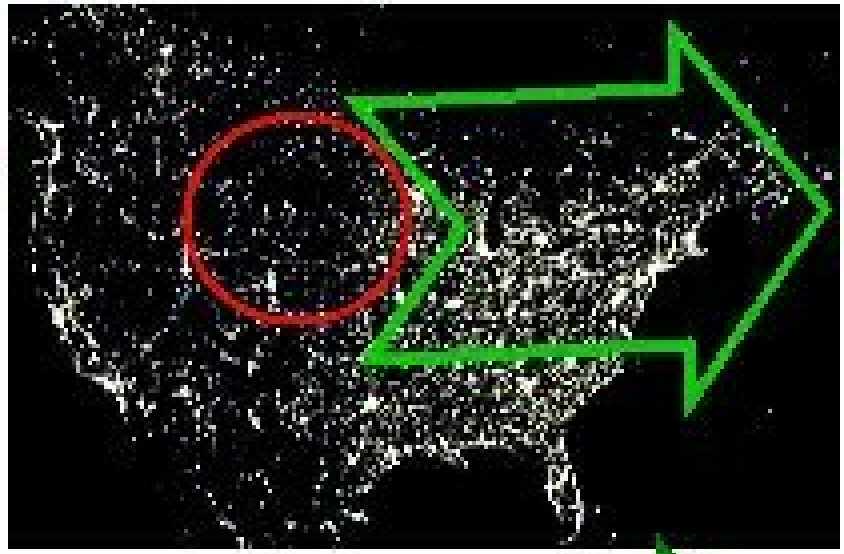
Intertribal Council On Utility Policy

Learning We Live In A WINDSHED !

The Richest Wind Energy Regime in the World is Just Upwind from the Region of Greatest Energy Consumption and Acid Rain Impacts in North America!!

UpWind Generation ⇨ DownWind Benefits





Sustainable Homeland Economic Development based on Tribal Wind Energy Generation

Downwind Communities can Support Tribal Wind and Benefit from Clean Energy and Cleaner Air

www.EnergyIndependenceDay.org

Intertribal Council On Utility Policy

Electric Generation Makes *MORE* than Electrons

Costs of Pollution are ***Externalized*** by Utilities

Global Warming **GHGs**

CO_2

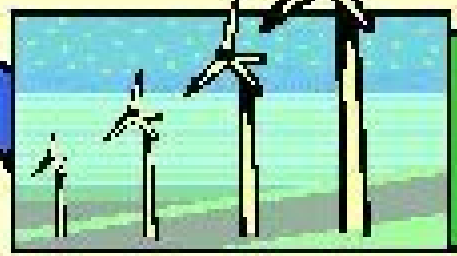
Air & Water Emissions:

SO_x NO_x
Mercury &
Particulates

"Acid Rain" and Health Impacts

... and are ***paid*** by the Environment and People

ELECTRICITY into the GRID



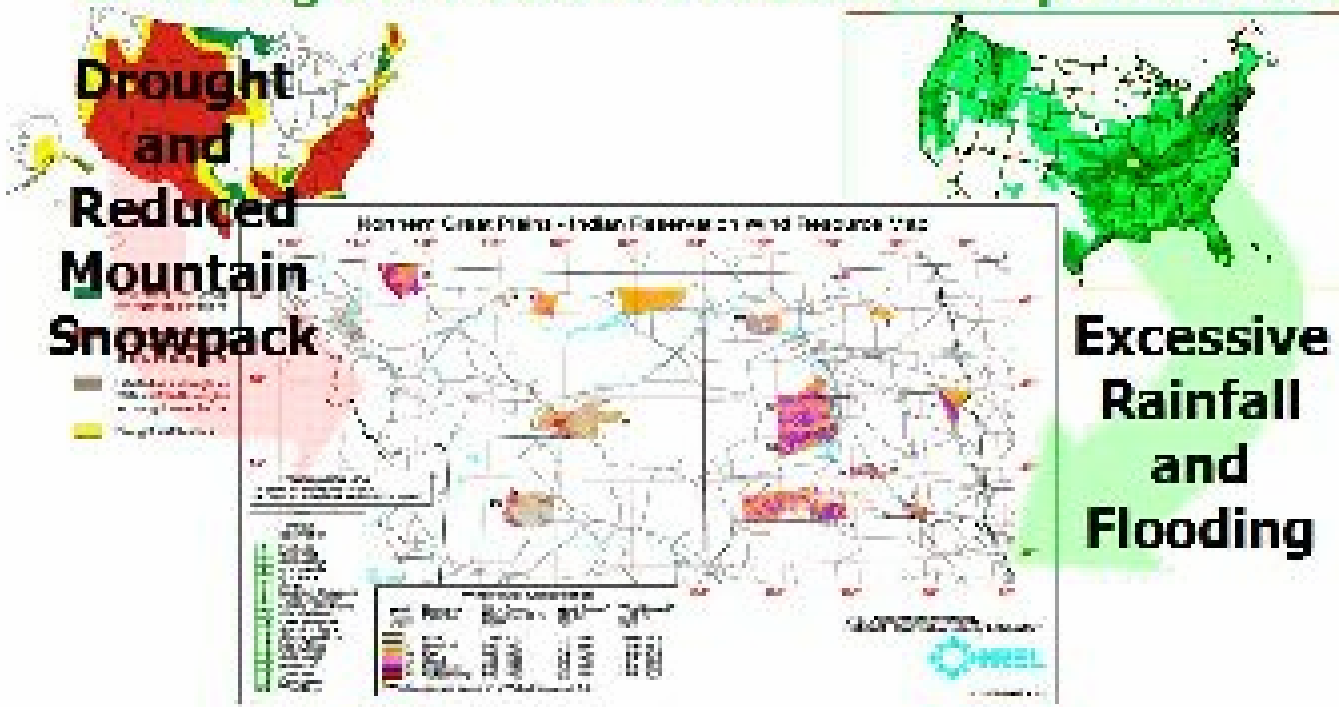
"Green" **Environmental Attributes**

Costs of Clean Attributes are ***Subsidized*** by *"Green Tags"* Buyers

Intertribal Council On Utility Policy

TRIBAL WIND - FEDERAL HYDROPOWER:

Breaking the Positive Feedback Loop in the CO2 Energy Cycle



Tribal Wind **can replace diminishing Federal Hydropower on Federal Transmission Grid.**

Missouri River is at all time historical low-water level !

The present drought and precipitation shifts are consistent with changing climate scenarios associated with increased levels of CO_2 from coal fired power plants -- the "New Normal". While precipitation has shifted to the east, the infrastructure has not. Now, more water falls downstream of the dams, diminishing the hydropower available to WAPA.

Rosebud Sioux & Intertribal COUP

Environmental Justice Revitalization Plan:

1,000 MWs of Tribally Owned Wind Power Across the Northern Great Plains
Financed Through Sales of Energy and Environmental Attributes ("Green Tags")

Phase 1 (2003):
1st Tribally owned 750 kW Turbine on Rosebud Reservation
Commissioned March 4th, Dedicated May 1st, 2003

Phase 2 (2004/5):
30 to 50 MW Wind Ranch on Rosebud Reservation

Phase 3 (2004/6):
80MWs: 10 MW Wind Ranches on 8 Reservations

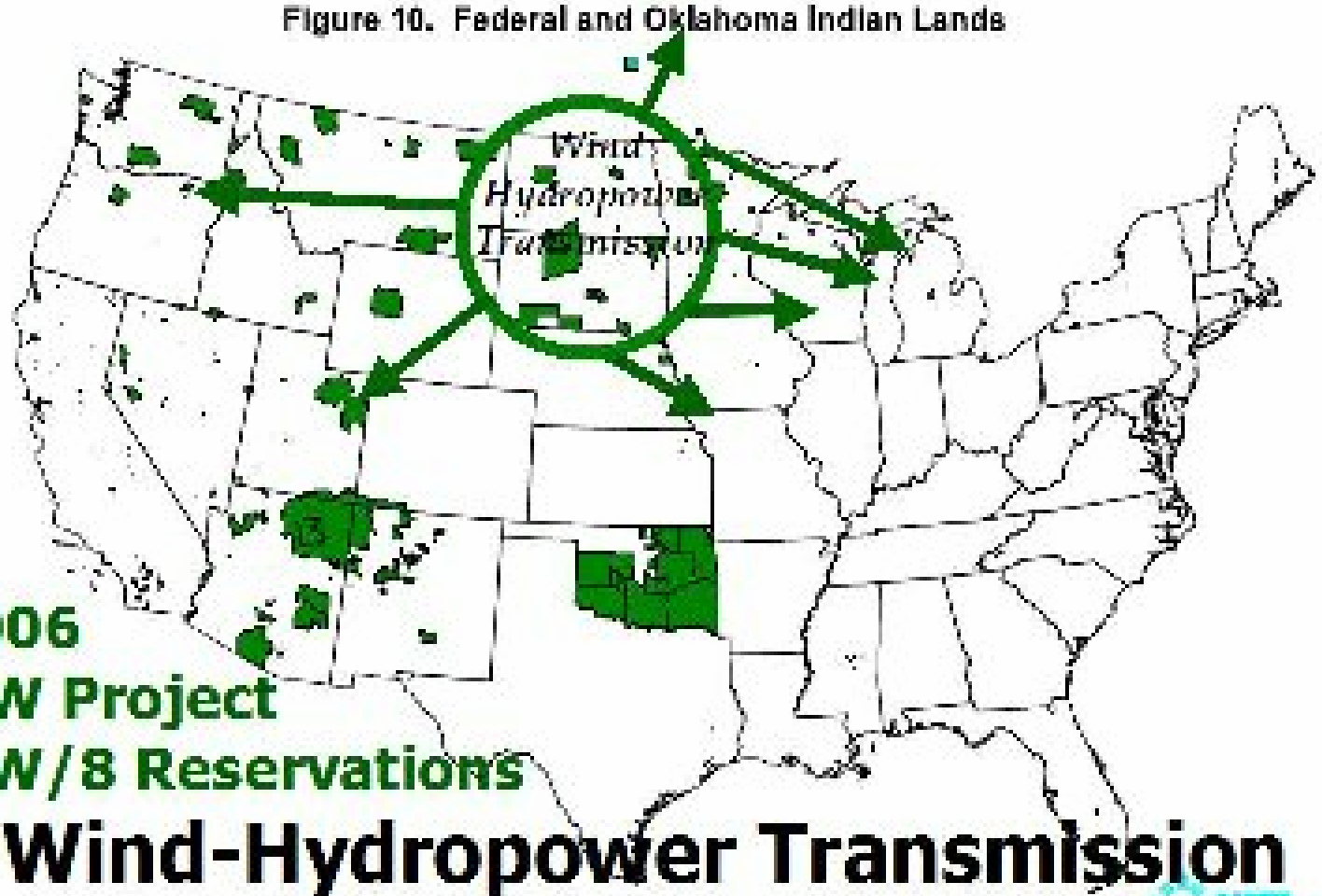
Phase 4 (2004-2008):
Expand and Replicate across the Northern Great Plains

Phase 5 (2006/15):
3,000 Tribal MW on Great Plains Reservations

NATIVEWIND.ORG

Tribal Wind Power for Sustainable Homeland Economic Development

Intertribal COUP
Federal Demonstration Project



By 2006
80 MW Project
10 MW/8 Reservations

Intertribal COUP Extended Demonstration Project

Figure 10. Federal and Oklahoma Indian Lands

By 2015
3,000 MW Project
150 MW/20 Reservations

Wind-Hydropower Transmission

COUP Wind EJ Demonstration

A CHOICE: In this decade, the Northeastern U.S. can have the downwind fossil fuel emissions of at least ...

There are 5,700 MW of new coal generation projected for the "high boundary" case announced in the four northern Great Plains (MT, WY, ND & SD) states through 2007, complete with:

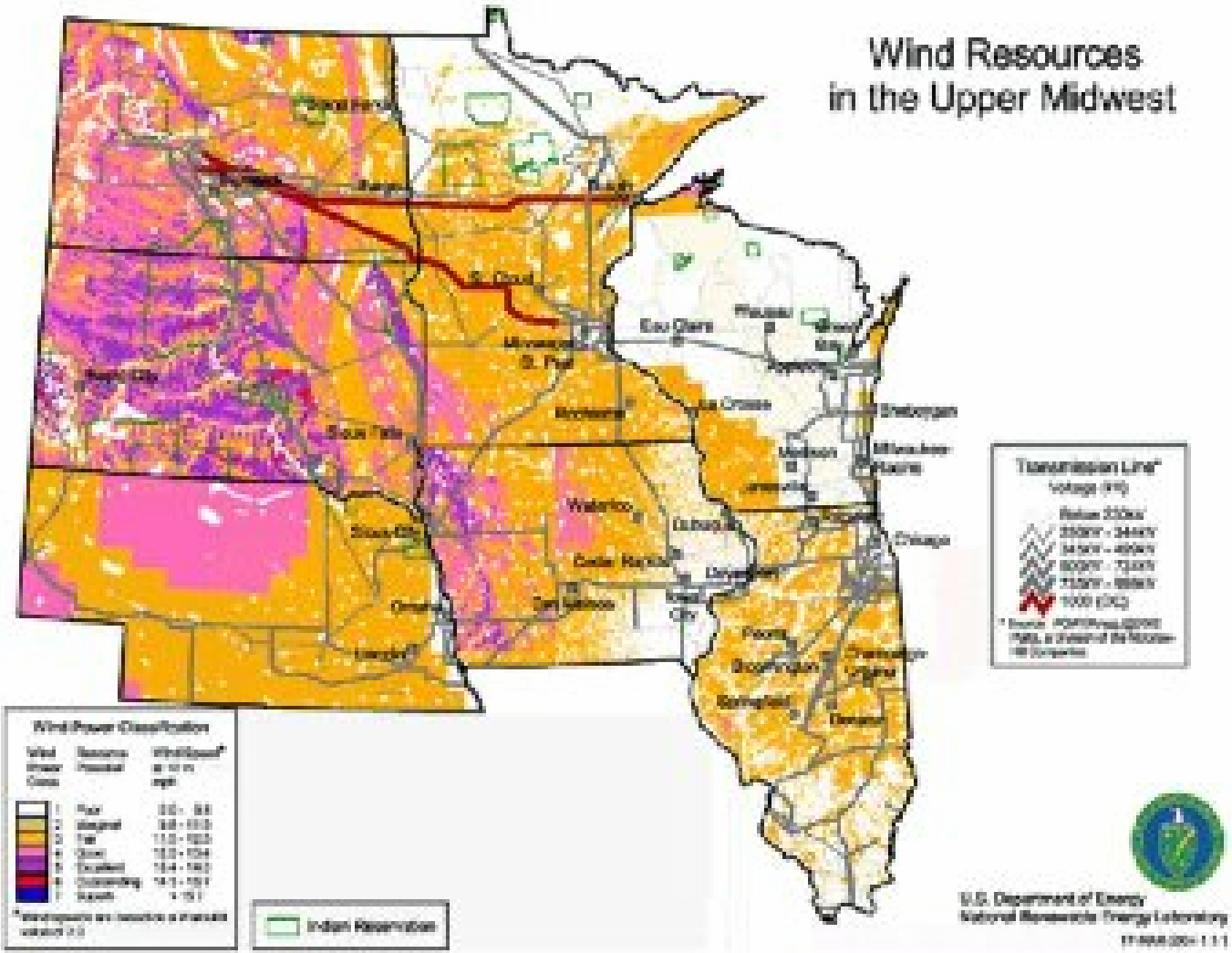
- **31,986,746 tonnes of CO2** (contributing to global warming)
- **28,962 tonnes of SO2** and **22,770 tons of NOx**, (acid rain downwind)
- **691 kilograms of mercury** (air borne toxin to downwind waters & wildlife)

estimated to be annually associated this new fossil fuel development.

With "*Tribal Green Tags*" the *WindSHED* can support the development on Tribal lands of at least ...

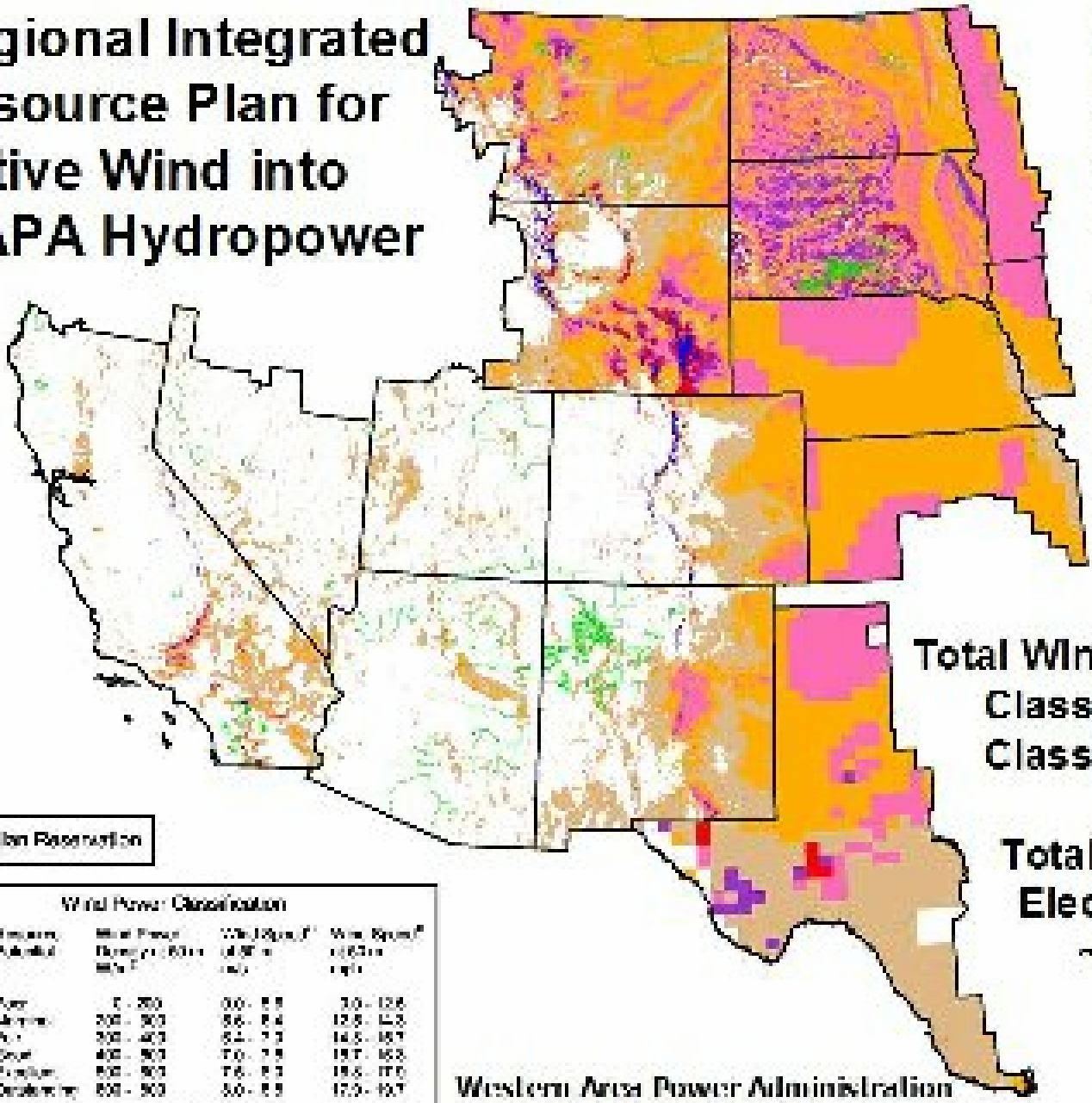
- ***Tribal Green Tags*** (downwind environmental benefits associated with upwind clean energy development) generated by tribally owned, utility scale wind turbines developed on Northern Great Plains Indian Reservations.
- ***Tribal Green Tags*** result direct and practical improvements in the economic and ecological health in our region's *WindSHED*, for both the host reservations and for all the downwind communities.

Clean Upwind Resource For Downwind Loads



http://www.nrel.gov/wind/uppermidwestanalysis.html

Regional Integrated Resource Plan for Native Wind into WAPA Hydropower



Nine of the Top Ten Wind States In the U.S. are located in the WAPA Service Territory

WAPA's total hydro-power capacity Is 17,474 MWs with 2,791 MWs UGPR

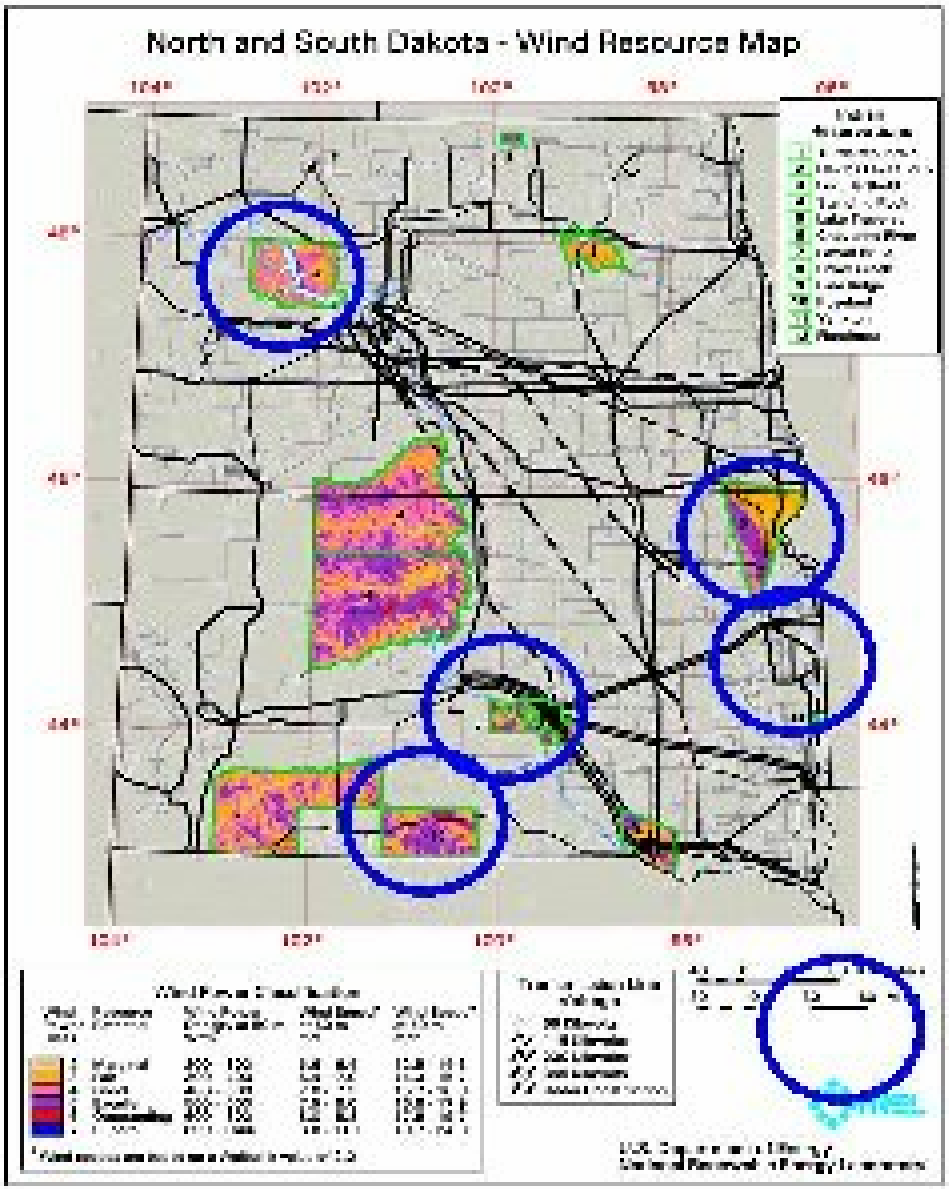
Total Wind Power Potential:
Class 3+ 4,500 GWs
Class 4+ 2,000 GWs

Total U.S. Installed Electric Capacity
~ 800 GWs

U.S. Department of Energy
National Renewable Energy Laboratory

NREL

INTERTRIBAL COUP
Initial Distributed Wind Development Plan



COUP Tribes have, by Resolution, signed on to participate in the Federal/ Intertribal 80 MW Inter-Agency Environmental Justice Wind Development Demonstration Project. (Two Tribes pending)

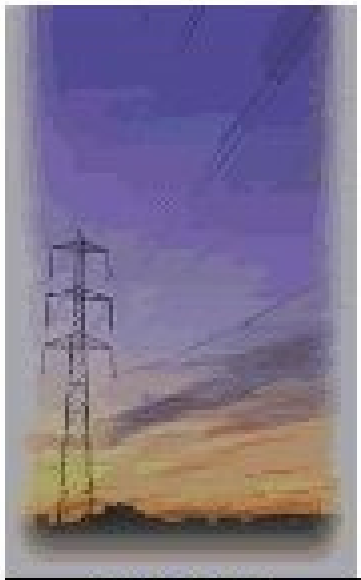
This tribally-owned, distributed generation 80 MW project will be built in 10 MW projects on each of the participating COUP Reservations. Each project site capable of 50-150 MWs expansion.

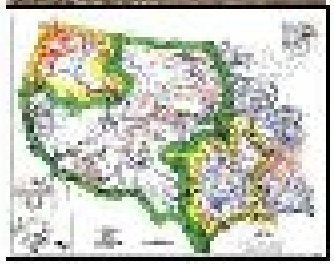
Restoring and Recharging "The Federal Renewable Energy Grid"

Western Area Power Administration

Serving the West with Federal Hydropower

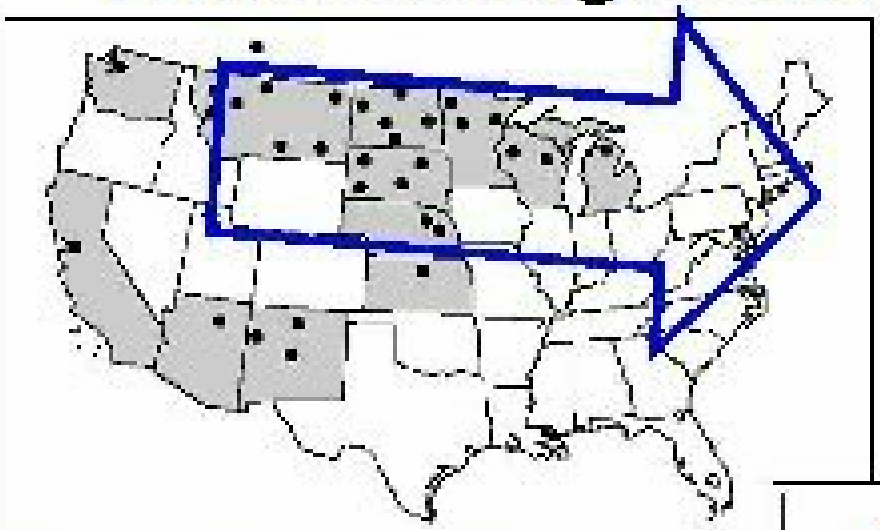
... And Tribal Renewable Energy

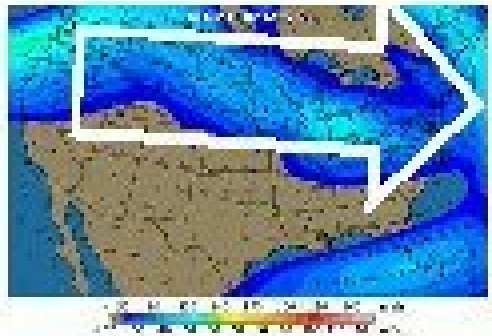




- Cities & Tribes are on WAPA grid as eligible WAPA *"Preference Customers"*
- Federal trust responsibility to Tribes
- Sustainable Homeland Economies
- Great Wind/Hydro Dynamo Potential
- Diminishing Hydropower Resource
- Clean Air Quality and Attainment
- Once 100% renewable, now only 20% hydropower and 80% coal
- Federal Renewable Energy Grid 20% hydro & 30% wind / 50% coal-gas

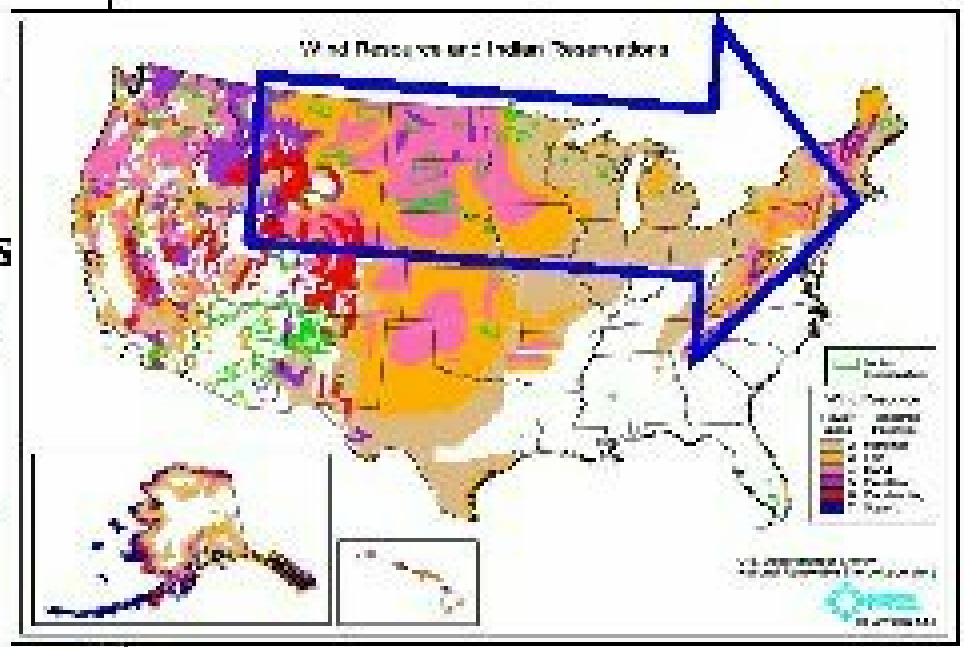
Tribal Colleges and Wind Resources





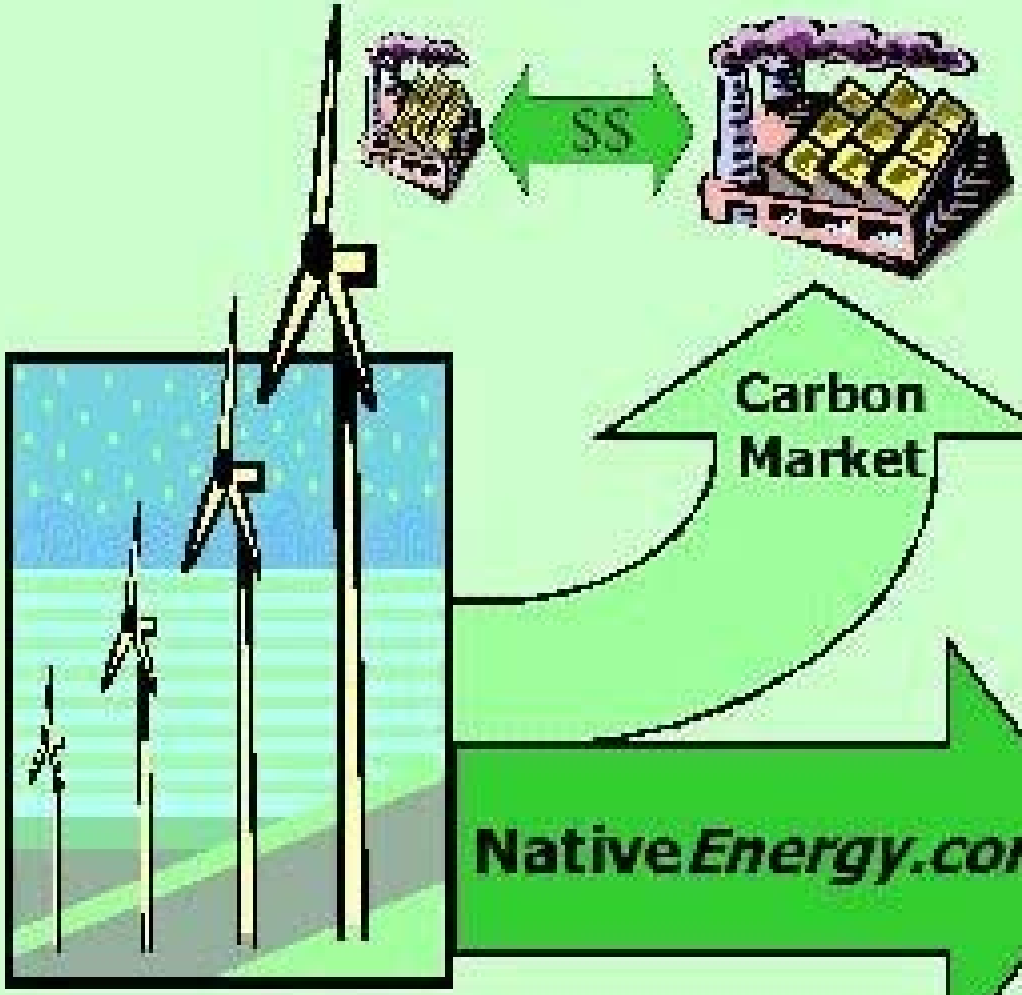
Prevailing Windshed

- **Climate/Natural Resource monitoring training/projects**
- **Meteorological Data Centers**
- **Wind Development Training courses for Reservation job creation and employment**
- **Wind Forecasting along the Windshed for value-add firm power sales into the market**



"Green Tags"

Like Electricity, A Marketable Commodity

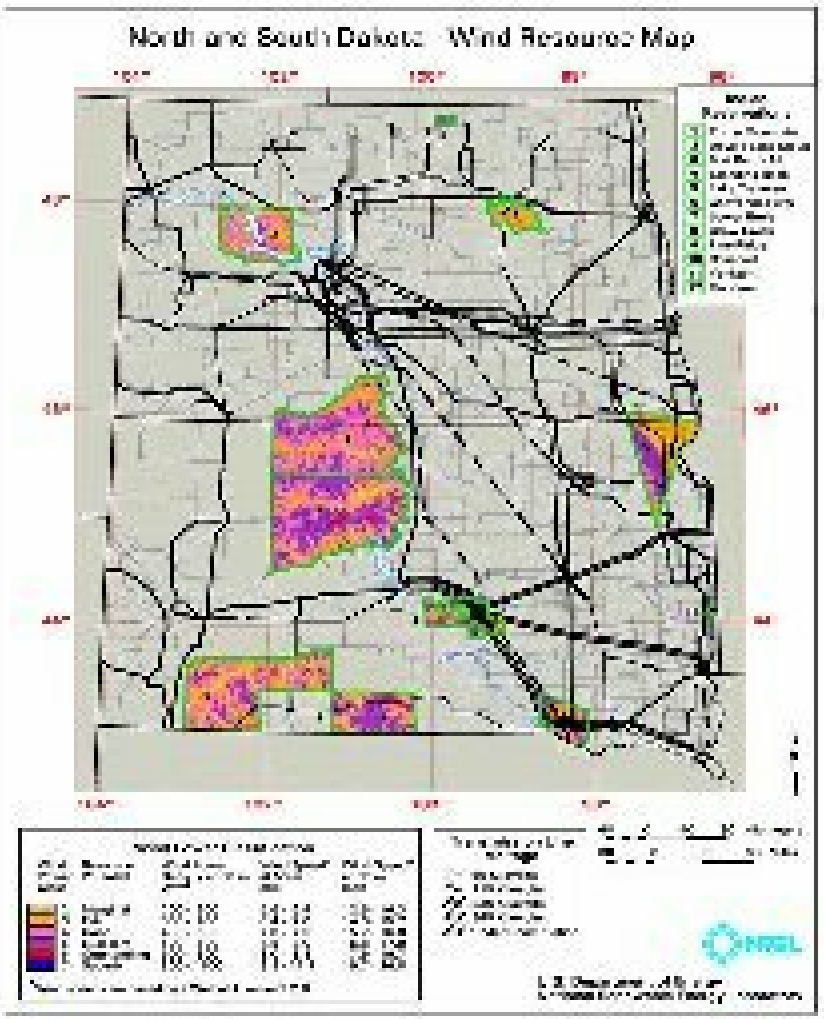


"Green Tags" can be sold into a *Cap and Trade*, *CDM* or other *Carbon Market* programs, creating continued pollution at other sites (***"Hot Spots"***) where utilities buy tags to become "clean on paper".

Or ...

They can be **sold** to downwind supporters of renewable energy, ***retired*** and ***taken out of market circulation.***

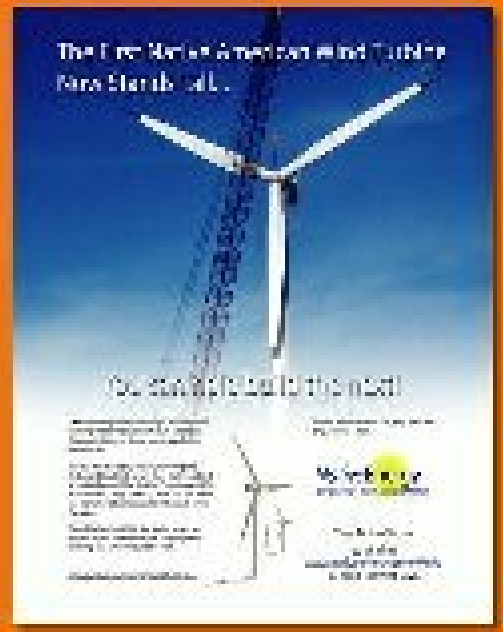
Tribal *"Green Tags"* Concept



- Tribal ***"Green Tags"*** present an innovative and extremely economic way to support Tribally owned, utility -scale wind projects in remote areas that are trapped within a constrained transmission grid system.
- Electricity can be sold for local consumption with little transmission, while Tribal ***"Green Tags"*** can be purchased by downwind communities far away from projects.

Marketing Tribal Green Tags

Reaching out to the marketplace...



...fighting global warming!

NativeEnergy

www.NativeEnergy.com

·I·C·L·E·I
Local
Governments
for Sustainability

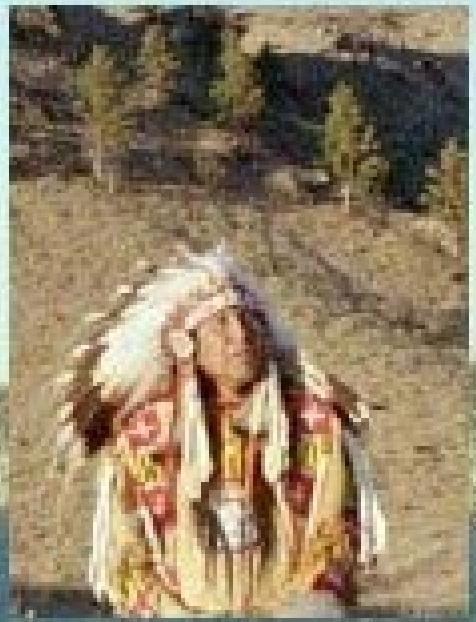
Honor the Earth

NATIVEWIND
ENERGY INDEPENDENCE
INTERTRIBAL COUP

American Leadership
Energy Independence Day. org
Local Government/Tribal Partnership
Signers to Date

ICLEI
Local Governments for Sustainability

NativeWind ...
The Coming Generation!



Intertribal COUP Public Service Announcement

www.EnergyIndependenceDay.org

NativeWind
Powering America

24 TRIBES with over 200 GWs of Wind Power Potential

Supporting Tribal Renewable Energy:

***PRACTICE:** Energy conservation and efficiency*

***ENCOURAGE:** Local governments to join COUP-ICLEI Energy Independence Day Campaign!*

***DEMAND:** Federal grids carry Tribal Renewable Energy*

***PURCHASE:** Tribally Generated Green Power & "Green Tags"*

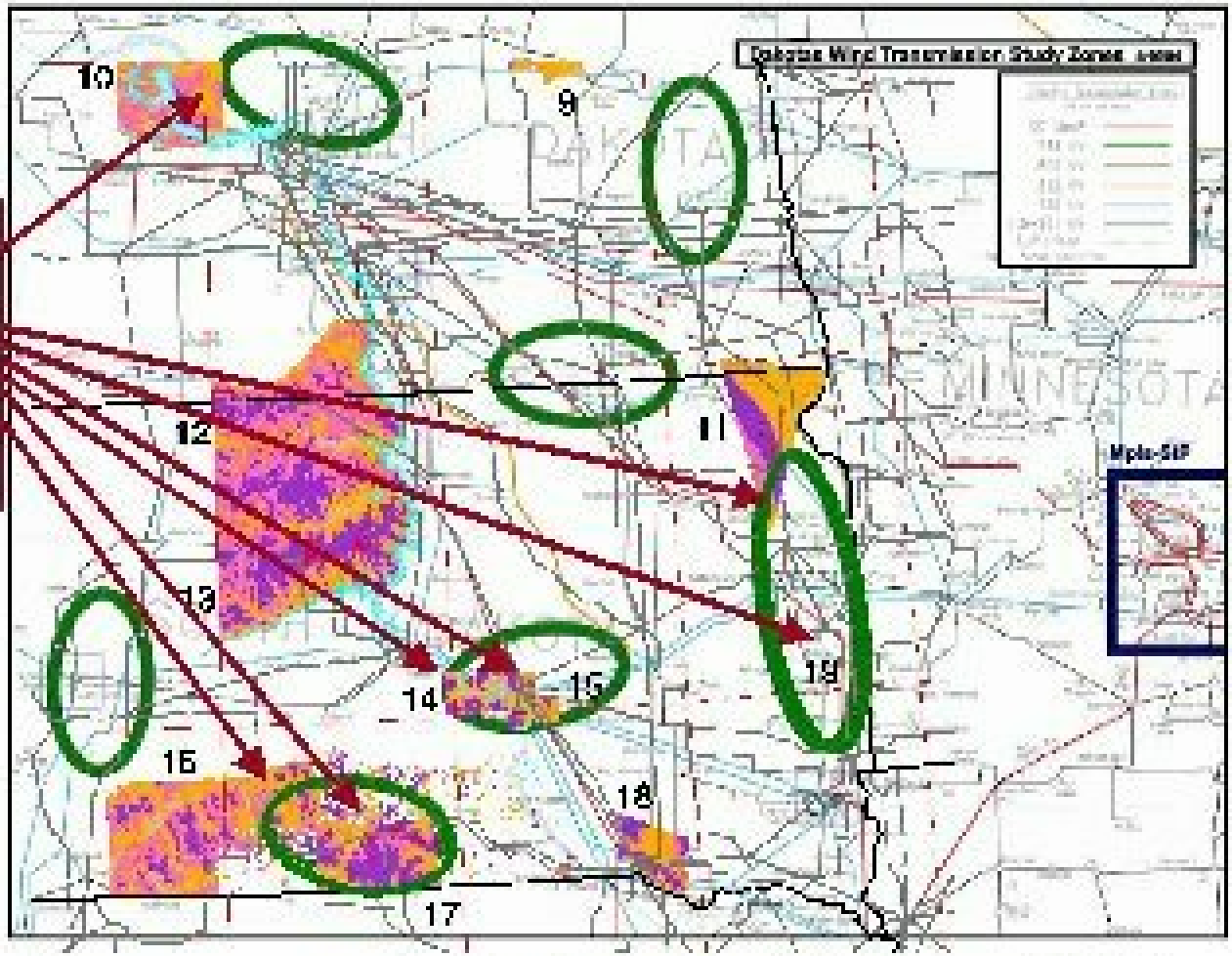
www.NativeEnergy.com

Intertribal Council On Utility Policy

WAPA / WIND INTEGRATION STUDY AREA

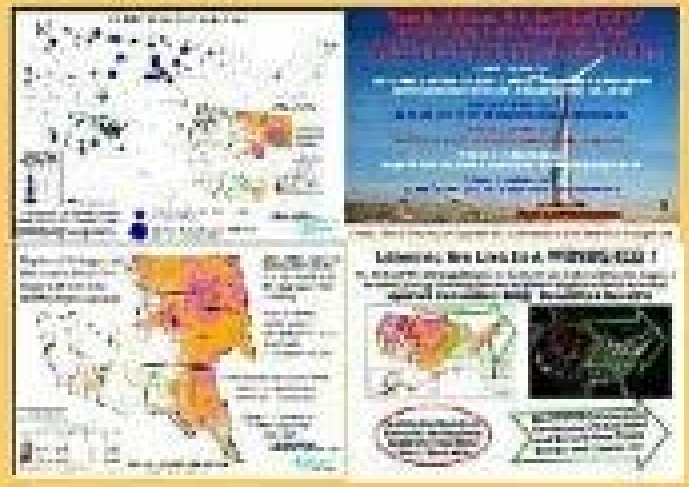
Includes Several Reservation Interconnection Sites

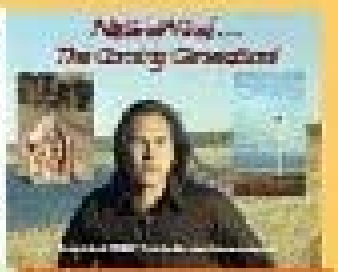
COUP Proposed WAPA Wind Study Site Areas

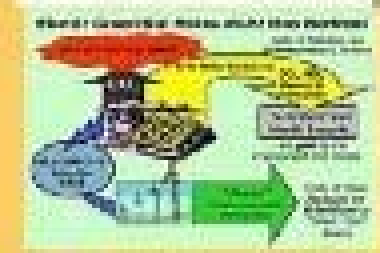


http://www.wapa.gov/ugp/study/DakotasWind/Zone%20Map.pdf

Energy Independence







NativeWind

Intertribal COUP - Council On Utility Policy
ICLEI - Cities for Climate Protection
NativeWind.org

EPA Air Innovations Conference

Tribal Renewable Energy Efforts Helping on Air Quality and Climate Change Issues